



# CPG35K AND CP35KB PASSIVE PENNING GAUGE INSTRUCTION MANUAL

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Original Instructions



# Declaration of Conformity

We, Edwards,  
Innovation Drive,  
Burgess Hill,  
West Sussex,  
RH15 9TW, UK

declare under our sole responsibility, as manufacturer and person within the EU authorised to assemble the technical file, that the product(s)

- Passive Penning (CPG) gauges connected to controllers (PGC).

D03000100	CPG35K - NW40
D03000110	CPG35K - DN40CF
D03000130	CPG35K - NW25
D03000140	CPG35KB - DN40CF
D03000400	PGC201 Pirani/Penning Contr +*

D03000101	CPG cable 5 m
D03000102	CPG cable 10 m
D03000103	CPG cable 20 m
D03000104	CPG cable 30 m
D03000105	CPG cable 50 m

to which this declaration relates is in conformity with the following standard(s) or other normative document(s)

EN61010-1:2010	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use. General Requirements
EN61326-1:2013 Class B, Industrial	Electrical equipment for measurement, control and laboratory Use. EMC requirements. General requirements

and fulfils all the relevant provisions of

(+) 2014/35/EU	Low Voltage Directive
(*) 2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Certain Hazardous Substances (RoHS) Directive
2012/19/EU	Waste from Electrical and Electronic Equipment (WEEE) Directive

*Note: This declaration covers all product serial numbers from the date this Declaration was signed onwards.*

Larry Marini, Senior Technical

07.06.2017, Eastbourne

Date and Place

*This product has been manufactured under a quality management system certified to ISO 9001:2008*

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# Safety

## Symbols used

### Symbols for residual risks



#### **WARNING:**

Warnings are given where failure to observe the instruction could result in injury or death to people.



#### **CAUTION:**

Cautions are given where failure to observe the instruction could result in damage to the equipment, associated equipment and process.



#### **Note:**

*Information on correct handling or use. Disregard can lead to malfunctions or minor equipment damage.*

## Personnel qualifications

All work described in this document may only be carried out by persons who have suitable technical training and the necessary experience or who have been instructed.

## General safety instructions

- Adhere to the applicable regulations and take the necessary precautions for the process media used.
- Consider possible reactions with the product materials.
- Adhere to the applicable regulations and take the necessary precautions for all work to be performed and consider the safety instructions in this document.
- Ensure that all vacuum components have not been contaminated before beginning any work. If so, adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.

Communicate the safety instructions to all other users.

## Responsibility and warranty

Edwards will not assume any responsibility or warranty in cases where the operator or third persons:

- Do not observe the information given in this document.
- Do not use the product as intended.
- Modify the product in any way (conversions, repair work etc).
- Operate the product with accessories not listed in the corresponding product documentation.

Subject to technical alterations without prior notice. The figures are not binding.

## Description

The CPG is a Penning gauge head. Operation of the gauge head is based on the principle of cold cathode ionisation.

## Product Identification

In all communication with Edwards, please specify the information on the product nameplate.

## Validity

This document applies to the following part numbers:

<b>Product Description</b>	<b>Item number</b>
CPG35K NW40 Passive Penning Gauge	D03000100
CPG35K DN40CF Passive Penning Gauge	D03000110
CPG35K NW25 Passive Penning Gauge	D03000130
CPG35KB DN40CF Passive Penning Gauge Bakeable	D03000140

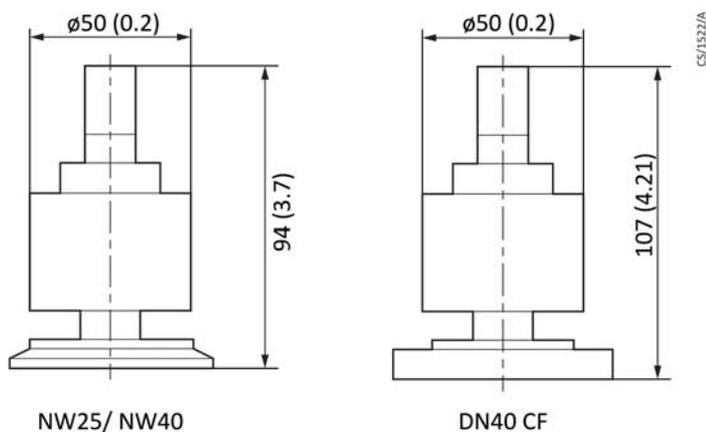
## Intended use

The CPG may only be used for the measurements of total pressures in vacuum systems and only when converted to a PGC201 vacuum gauge controller instrument.

## Technical data

Measurement principle	Gas discharge
Measurement range	$1 \times 10^{-9}$ to $1 \times 10^{-2}$ mbar
Material in contact with the medium	Cr, Mo, Nb, Ti, Ni, NiFe, NiCr, glass and ceramics
Disruption pressure (burst pressure) (absolute)	10 bar
Ambient temperature	
CPG35K	80 °C
CPG35KB	200 °C
Measurement volume	
CPG35K - NW25 and NW40	approximately 18 cm <sup>3</sup>
CPG35K and KB - DN40CF	approximately 21 cm <sup>3</sup>
Connection flange	
CPG35K	NW25
CPG35K	NW40
CPG35K	DN40CF
CPG35KB	DN40CF
Weight	
CPG35K - NW25 and NW40	approximately 0.30 kg
CPG35K and KB - DN40CF	approximately 0.60 kg

Figure 1 Dimensions



# Installation



## WARNING:

Do not use the CPG for safety critical applications. The CPG is not intended to be fail safe.



## WARNING:

Do not use the CPG to measure the pressure of explosive or flammable gasses or mixtures.

## Supplied equipment

- CPG gauge head
- Operating instructions

The gauges outlined in this manual are for use with the Edwards PGC201 controller.

## Unpacking and inspecting

Remove all packing materials and protective covers and check the CPG35K(B) gauge. If the CPG35K(B) gauge is damaged, notify your supplier and carrier in writing within three days; state the Item Number of the CPG35K(B) gauge together with the order number and supplier's invoice numbers. Retain all packaging materials for inspection. Do not use the CPG35K(B) gauge if it is damaged.

## Vacuum connection

The gauge head is connected via a NW25/NW40 flange and a centring-ring to the vacuum system. In the case of DN 40 CF flanges a copper gasket must be inserted between the flanges.

All gauges should be located as close as possible to the point where the pressure is to be measured with the exception of cases where there is potential for considerable contamination of the gauge head. In these cases, the gauge head should be mounted a short distance away (behind an elbow).

In the case of long and narrow connections, the measured pressure will be too low, mainly because of gas consumption by the gauge head. The gauge head may be mounted in any position, but preferably not at the lowest point in the vacuum system.

## Electrical connection



## CAUTION:

When connecting the gauge head cable special care must be taken to plug the cable end equipped with the socket contact onto the pins of the gauge head connector.

The knurled screw on the plug is used to lock the connection.

## Maintenance



### **WARNING:**

**Contaminated parts can be detrimental to health and environment.**

**Before beginning work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.**



### **CAUTION:**

**Dirt and damage can impair the function of the vacuum component.**

**When handling vacuum components, take appropriate measures to ensure cleanliness and prevent damage.**



### **CAUTION:**

**Touching the product with bare hands increases the desorption rate.**

**Always wear clean, lint-free gloves and use clean tools when working in this area.**

## Cleaning of the gauge head

To clean the gauge, pull out anode ring (Figure 2 item 5), ceramic disc (Figure 2 item 6) and cathode plate (Figure 2 item 4) inside the housing (see [Mechanical maintenance](#)). If required, clean the anode ring with abrasive emery cloth. Do not attempt to clean the cathode plates. Dirty cathode plates must be exchanged.

In order to provide protection against soiling of the bushing, the gauge heads are supplied with a ceramic disk between the anode ring and the bushing.

The position of the disk is shown in [Figure 2](#).

Each time the anode ring or cathode plate is exchanged, the ceramic disc must also be exchanged.

No cleaning is required when exchanging the cathode plate and anode ring. Refer to [Mechanical maintenance](#).

After removing the emery paper residues and reassembly of the components, any fingerprints and other residues have to be removed by rinsing the gauge head with a solvent, followed by a drying period.

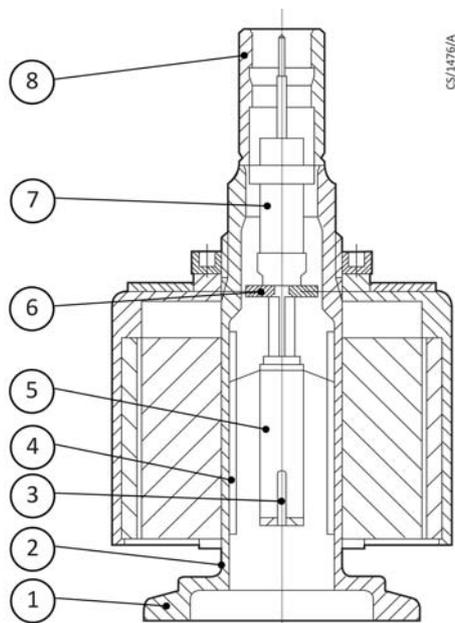
For thorough cleaning of the gauge head cell, it is recommended to dismantle the permanent magnets. Only then it is possible to flush out any iron filings from the measuring chamber that have been attracted by the magnets.

**Note:**

*Do not allow the ceramic bushing to get wet as it is able to absorb water.*

*The leakage current which results then causes the pressure to be shown on the operating device as higher than it actually is.*

**Figure 2 Sectional view of the CPG35K(B) gauge head**



- 1 Small flange NW25, NW40, DN40 CF
- 2 Gauge head body
- 3 Anode pin
- 4 Cathode plate
- 5 Anode ring with ignition pin
- 6 Ceramic disc
- 7 Current leadthrough
- 8 Connection socket

## Mechanical maintenance

### Removing and replacing the anode ring and the cathode plate

1. With a pair of flat nose pliers it is possible to remove the anode ring and the cathode plate (Figure 2 item 4) fixed elastically in the measurement chamber from the measurement chamber.
2. Replace or clean the removed parts (see [Cleaning of the gauge head](#)).
3. After having inserted the anode ring it should be strictly observed that the two open sides of the anode ring are equally distant from the cathode plate and that the ignition pins don't touch the chamber (distance approximately 1 mm).

## **Detaching the permanent magnet**

1. Detach the gauge head cable.
2. Unscrew and remove the nut on the protection cap.
3. Remove the protection cap and the magnet.
4. Clean as described in [Cleaning of the gauge head](#).
5. Reassemble in the reverse order.

## Spare parts and accessories

### Spares

When ordering spare parts, always indicate:

- All information on the product nameplate.
- Description and ordering number according to the spare parts list.

Description	Item number
Spare cathode plates and discs	D03000109
Spare Anode Ring	D03000119

### Accessories

Description	Item number
CPG Cable 5 m	D03000101
CPG Cable 10 m	D03000102
CPG Cable 20 m	D03000103
CPG Cable 30 m	D03000104
CPG Cable 50 m	D03000105

## Storage



**CAUTION:**

**Inappropriate storage leads to an increase of the desorption rate and/or may result in mechanical damage of the product.**

**Cover the vacuum ports of the product with protective lids or grease free aluminum foil. Do not exceed the admissible storage temperature range.**

## Returning the product



### **WARNING:**

**Products returned to Edwards for service or repair should, if possible, be free of harmful substances (for example, radioactive, toxic, caustic or microbiological). Otherwise, the type of contamination must be declared.**

**Adhere to the forwarding regulations of all involved countries and forwarding companies and enclose a completed contamination declaration.**

Products that are not clearly declared as "free of harmful substances" are decontaminated at the expense of the customer.

Products not accompanied by a duly completed declaration of contamination are returned to the sender at his own expense.

# Disposal



## **WARNING:**

Contaminated parts can be detrimental to health and environment.

Before beginning to work, find out whether any parts are contaminated. Adhere to the relevant regulations and take the necessary precautions when handling contaminated parts.



## **WARNING:**

Products returned to Edwards for service or repair should, if possible, be free of harmful substances (for example, radioactive, toxic, caustic or microbiological). Otherwise, the type of contamination must be declared.

Adhere to the forwarding regulations of all involved countries and forwarding companies and enclose a completed contamination declaration.

## Separating the components

After disassembling the product, separate components according to the following criteria:

### Contaminated components

Contaminated components (radioactive, toxic, caustic or biological hazard, and so forth) must be decontaminated in accordance with all local and national regulations, separated according to their materials, and disposed of.

### Other components

Such components must be separated by material make-up and then recycled.

### Other Disposal Information

The CPG35K(B) and associated cables are within the scope of the European Directive on Waste and Electronic Equipment, 2012/19/EU. Edwards offers customers a recycling service for the product/cables/associated gauge heads at the end of the product's life. Contact Edwards for advice on how to return the CPG and/or cables for recycling.

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## Return of Edwards Equipment - Procedure

### INTRODUCTION

Before returning your equipment, you must warn Edwards if substances you used (and produced) in the equipment can be hazardous. This information is fundamental to the safety of our Service Centre employees and will determine the procedures employed to service your equipment.

**Complete the Declaration (HS2) and send it to Edwards before you dispatch the equipment.** It is important to note that this declaration is for Edwards internal use only, and has no relationship to local, national or international transportation safety or environmental requirements. As the person offering the equipment for shipment, it is your responsibility to ensure compliance with applicable laws.

### GUIDELINES

- Equipment is '**uncontaminated**' if it has not been used, or if it has only been used with substances that are not hazardous. Your equipment is '**contaminated**' if it has been used with any substances classified as hazardous under the UN Globally Harmonised System on the classification and labelling of chemicals (GHS), EU Regulation No 1272/2008 on classification, labelling and packaging (CLP) or US Occupational Safety and Health regulations (29CFR1910.1200, Hazard Communication).
- If your equipment has been used with radioactive substances, biological or infectious agents, mercury, polychlorinated biphenyls (PCB's), dioxins or sodium azide, you must decontaminate it before you return it to Edwards. You must send independent proof of decontamination (for example a certificate of analysis) to Edwards with the Declaration (HS2). Phone Edwards for advice.
- If your equipment is contaminated, you must either:
  - Remove all traces of contamination (to the satisfaction of laws governing the transportation of dangerous/hazardous substances).
  - Or, properly classify the hazard, mark, manifest and ship the equipment in accordance with applicable laws governing the shipment of hazardous materials.

**Note: Some contaminated equipment may not be suitable for airfreight.**

### PROCEDURE

1. Contact Edwards and obtain a Return Authorisation Number\* for your equipment.
2. Complete the Return of Edwards Equipment - Declaration (HS2).
3. If the equipment is contaminated, you must contact your transporter to ensure that you properly classify the hazard, mark, manifest and ship the equipment, in accordance with applicable laws governing the shipment of contaminated/hazardous materials. As the person offering the equipment for shipment, it is your responsibility to ensure compliance with applicable law. **Note: Equipment contaminated with some hazardous materials, such as semiconductor by-products, may not be suitable for airfreight - contact your transporter for advice.**
4. Remove all traces of hazardous gases: pass an inert gas through the equipment and any accessories that will be returned to Edwards. Where possible, drain all fluids and lubricants from the equipment and its accessories.
5. Seal up all of the equipment's inlets and outlets (including those where accessories were attached) with blanking flanges or, for uncontaminated product, with heavy gauge tape.
6. Seal equipment in a thick polythene/polyethylene bag or sheet.
7. If the equipment is large, strap the equipment and its accessories to a wooden pallet. If the equipment is too small to be strapped to a pallet, pack it in a suitable strong box.
8. E-mail via scan, fax or post a copy of the original with signature of the Declaration (HS2) to Edwards. The Declaration must arrive before the equipment.
9. Give a copy of the Declaration (HS2) to the transporter. You must tell your transporter if the equipment is contaminated.
10. Seal the original Declaration in a suitable envelope: attach the envelope securely to the outside of the equipment package, in a clear weatherproof bag.

**WRITE YOUR RETURN AUTHORISATION NUMBER\* CLEARLY ON THE OUTSIDE OF THE ENVELOPE OR ON THE OUTSIDE OF THE EQUIPMENT PACKAGE.**

\* not applicable in Japan

# Return of Edwards Equipment - Declaration

Return Authorisation Number: \_\_\_\_\_

You must:

- Know about all of the substances which have been used and produced in the equipment before you complete this Declaration
- Read the Return of Edwards Equipment - Procedure (HS1) before you complete this Declaration
- Contact Edwards to obtain a Return Authorisation Number and to obtain advice if you have any questions
- Send this form to Edwards before you return your equipment as per the procedure in HS1

## SECTION 1: EQUIPMENT

Manufacturer's Product Name \_\_\_\_\_  
 Manufacturer's Part Number \_\_\_\_\_  
 Manufacturer's Serial Number \_\_\_\_\_

Has the equipment been used, tested or operated?  
 YES, Used or operated  Go to Section 2  
 YES, Tested, but not connected to any process or  
 production equipment, and only exposed to Nitrogen,  
 Helium or Air  Go to Section 4  
 NO  Go to Section 4

**IF APPLICABLE:**

Tool Identification Number \_\_\_\_\_  
 Tool Manufacturer/OEM \_\_\_\_\_  
 Tool Model \_\_\_\_\_  
 Process \_\_\_\_\_  
 Installed Date \_\_\_\_\_ De-installed Date \_\_\_\_\_  
 Part Number of Replacement Equipment \_\_\_\_\_  
 Serial Number of Replacement Equipment \_\_\_\_\_  
 Pump datalog attached? YES  NO   
 (Edwards Internal Use Only)

## SECTION 2: SUBSTANCES IN CONTACT WITH THE EQUIPMENT

Are any substances used or produced in the equipment:

- Radioactive, biological or infectious agents, mercury, poly chlorinated biphenyls (PCBs), dioxins or sodium azide? (if YES, see Note 1) YES  NO
- Hazardous to human health and safety? YES  NO

**Note 1:** Edwards will not accept delivery of any equipment that is contaminated with radioactive substances, biological/infectious agents, mercury, PCB's, dioxins or sodium azide, unless you:

- Decontaminate the equipment
- Provide proof of decontamination

**YOU MUST CONTACT EDWARDS FOR ADVICE BEFORE YOU RETURN SUCH EQUIPMENT**

## SECTION 3: LIST OF SUBSTANCES IN CONTACT WITH THE EQUIPMENT

Substance name	Chemical Symbol	Precautions required (for example, use protective gloves, etc.)	Action required after a spill, leak or exposure

## SECTION 4: RETURN INFORMATION

Reason for return and symptoms of malfunction: \_\_\_\_\_

For how many hours has the product run? \_\_\_\_\_ Do you wish to purchase a full Failure Analysis report? YES  NO

If you have a warranty claim:

- who did you buy the equipment from? \_\_\_\_\_
- give the supplier's invoice number \_\_\_\_\_

## SECTION 5: DECLARATION

Print your name: \_\_\_\_\_ Print your job title: \_\_\_\_\_  
 Print your organisation: \_\_\_\_\_  
 Print your address: \_\_\_\_\_

Telephone number: \_\_\_\_\_ Date of equipment delivery: \_\_\_\_\_

I have made reasonable enquiry and I have supplied accurate information in this Declaration. I have not withheld any information, and I have followed the Return of Edwards Equipment - Procedure (HS1).

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

**Note: Please print out this form, sign it and return the signed form as hard copy.**

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